Alaska Department of Fish and Game
Division of Wildlife Conservation
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Landscape Ecology and Population Dynamics of Moose in GMU 13

J. W. Testa

Research Performance Report
1 July 2000–30 June 2001
Federal Aid in Wildlife Restoration
Grant W-27-4, Project 1.55

This is a progress report on continuing research. Information may be refined at a later date.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

PROJECT TITLE: Landscape ecology and population dynamics of moose in GMU 13

AUTHOR: J. W. Testa

COOPERATORS: H. Golden, S. Farley, D. Spalinger

GRANT AND SEGMENT NR.: W-27-4

PROJECT NR.: 1.55

SEGMENT PERIOD: July 1, 2000-June 30, 2001

WORK LOCATION: Game Management Unit 13

STATE: Alaska

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: *Establish a comprehensive GIS for GMU 13.* A GIS database has been implemented for moose locations, and vegetation coverages have been incorporated.

OBJECTIVE 2: *Determine the feasibility and potential costs and benefits of replacing traditional moose counts with modern spatial density estimates.* Both methods were employed in 2000 to build the data set from which this objective will be addressed.

OBJECTIVE 3: *Develop statistical/biological models of population trends for moose in the NSA*. Bayesian models of population trend have been developed, as well as deterministic and stochastic models that incorporate population parameters determined from radio-collared moose.

OBJECTIVE 4: *To develop and test landscape models of habitat quality and utilization for moose in GMU 13*. No work on this aspect.

OBJECTIVE 5: *To develop and test landscape models of predation risk for moose in GMU 13.* See H. Golden's work on wolf movements: this is the first step in this objective.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: *Trend-count and composition surveys.* These were completed in November of 2000. Trend-count surveyors counted 808 moose in Count Areas 13 and 14.

JOB 2: *Moose density estimates.* The spatial density estimate in the Nelchina Study Area was 0.486 moose/km^2 (*SE* = 0.036), with 12 calves/100 cows and 15 bulls/100 cows.

JOB 3: *Radio-collaring adult and yearling moose.* Forty-two adult and yearling moose were captured and equipped with radio-collars.

JOB 4: *Radio-tracking/survival/reproduction.* Aerial radio-tracking accounted for 3,303 locations and observations of reproductive status of 82 moose in the project period.

JOB 5: *Vegetation/browsing surveys.* Moose fecal samples were collected for dietary analysis.

JOB 6: *Geographic Information System (GIS) management.* New software was developed for radio-tracking moose. Moose locations were entered into ArcView GIS

JOB 7: *Spatial and population modeling.* Deterministic spreadsheet models, and stochastic models of population growth were developed to estimate population growth rates. A simulation of calf mortality patterns was also written.

JOB 8: *Meetings and publications.* The following were published or submitted in the project period:

Testa, J. W. *In Review.* Bottom-up and top-down life history trade-offs and the population dynamics of moose. Ecology.

Testa, J. W. *In Review.* Does predation on neonates inherently select for earlier births? Journal of Mammalogy.

Hundertmark, K.J., M. Masteller, J.W. Testa, R. Tobey AND G. Del Frate. *In Press*. Selective harvest revisited: the effects of antler-based harvest strategies in three moose populations in Alaska. Alces 37: 000-000.

White, K. S., J. Berger and J. W. Testa. 2001. Behavioral and ecological effects of differential predation pressure on moose in Alaska. Journal of Mammalogy 82(2): 422-429.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

IV. FEDERAL AID TOTAL PROJECT COSTS FOR THIS SEGMENT PERIOD

$ 202,627

V. PREPARED BY:

J. Ward Testa
Wildlife Biologist III

APPROVED BY:

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Steven R Peterson, Senior Staff Biologist
Division of Wildlife Conservation

SUBMITTED BY:

Donald E. Spalinger
Research Coordinator

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Wayne L Regelin, Director
Division of Wildlife Conservation

APPROVAL DATE: _____